XINGE YANG

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EDUCATION

Ph.D, King Abdullah University of Science and Technology (KAUST) 2022 - 2025 (expected)
Computer Science. Advisor: Wolfgang Heidrich

M.Sc, King Abdullah University of Science and Technology 2020 - 2022
Computer Science. Advisor: Wolfgang Heidrich

B.Sc, University of Science and Technology of China (USTC) 2016 - 2020
Physics (major) and Computer Science (minor).

RESEARCH

My PhD research focuses on differentiable optics and its applications in End-to-End optical design and computational imaging. My representative work is **DeepLens**, a differentiable ray tracer for lens simulation and optimization. Some key features of DeepLens: (1) fully automated lens design from scratch, (2) inverse-rendering-based, task-driven End-to-End lens design for computer vision, (3) hybrid refractive-diffractive lens simulation and optimization, and (4) optics-aware camera algorithm design.

Research area: Differentiable ray tracing, End-to-End optical design, Computational imaging, Computational photography.

PUBLICATIONS

Image Quality is not All You Want: Task-Driven Lens Design Arxiv 2023
Xinge Yang, Qiang Fu, Yunfeng Nie, Wolfgang Heidrich.

Aberration Aware Depth from Defocus ICCP 2023, TPAMI 2023
Xinge Yang, Qiang Fu, Mohammed Elhoseiny, Wolfgang Heidrich.
International Conference on Computational Photography (**ICCP**)
IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**)

Curriculum Learning for *ab initio* Deep Learned Refractive Optics COSI 2022, Arxiv 2023
Xinge Yang, Qiang Fu, Wolfgang Heidrich.
OSA Imaging and Applied Optics Congress - Computational Optical Sensing and Imaging (**COSI**)

RESEARCH AND WORK EXPERIENCE

Research Scientist Intern 10/2023 - 01/2024
Meta Reality Lab, Optics & Display Research *Redmond, WA*

· Developed a differentiable ray tracer from scratch for gradient-based geometric waveguide design. Our differentiable design enables more optimization capabilities, faster optimization speed, and fewer computational resources.

Ms/PhD Student 08/2020 - now
KAUST, VCC Computational Imaging Group *Thuwal, Saudi Arabia*

· Developed a differentiable ray tracer, DeepLens, for imaging process simulation, automated lens design, End-to-End optical design, inverse rendering, and optics-aware camera algorithm design.

TEACHING EXPERIENCE

Teaching Assistant - GAMES 204: Computational Imaging 09/2022 - 12/2022
Chinese Graphics And Mixed Environment Symposium (GAMES) Webinar *Online*

Develop and grade assignments on computational imaging topics, including image signal processing, high dynamic range imaging, tone mapping, image deblurring, and multi-image fusion.

TECHNICAL SKILLS

Programming language: Python, C/C++, CUDA
Platform and tools: PyTorch, ZEMAX, Mitsuba, Blender

SERVICES

Reviewer for: IEEE TPAMI, Optica, Optics Express, JOSA A.

AWARDS

KAUST Ms/PhD Program Fellowship 2020 - 2025
Full scholarship supporting the progression of master and doctoral degrees.

KAUST CEMSE Dean's List Award 2023
Awarded to the top 20% PhD students, following nominations and based on research achievement.